

of NSR shows the height and length of Soundwall S746 to provide feasible abatement. However, constructing Soundwall S746 as a uniform 14-foot high wall provides an additional 1-dB of noise reduction for residences behind this wall. The estimated total construction cost of Soundwall S746 at 14-foot high is \$66,000 which is less than the reasonable allowance of \$102,000.

With consideration of the acoustic benefit and the incremental cost, Soundwall S746 is recommended to be a 14-foot high masonry wall as shown on Figure 9 and Table 2 in Appendix A2 of this report. In addition, the playground area of the preschool in this area would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S746 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required for this location. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for potential noise impact in the interior of the land use.

- **Soundwall S765:** Soundwall S765 would extend an existing 16-foot high soundwall 215 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at Bushard Street. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of four single-family residences to additional traffic noise predicted under Alternative 2 and therefore is recommended. Figure 9 and Table 2 in Appendix A2 of NSR shows the location and height of Soundwall S765.

With consideration of the acoustic benefit and the incremental cost, Soundwall S765 is recommended to range from 14- to 16-foot high masonry wall as shown on Figure 9 in Appendix A2 of this report.

- **Soundwall S766:** Soundwall S766 would extend an existing 14-foot high soundwall 145 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at Bushard Street. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of six single-family residences to additional traffic noise predicted under Alternative 2 and therefore is recommended. Figure 9 and Table 2 in Appendix A2 of NSR shows location and height of Soundwall S766.

With consideration of the acoustic benefit and the incremental cost, Soundwall S766 is recommended to be a 14-foot high masonry wall as shown on Figure 9 in Appendix A2 of this report.

- **Soundwalls S786, S788, & S792:** Soundwall S792 is an in-kind replacement of an existing 12-foot high (835 feet long) soundwall that would be required regardless of cost. Soundwall S788 is a new soundwall that extends

Soundwall S792 to the south by 190 feet to compensate for the exposure of freeway traffic noise to five single-family residences due to the opening provided by the structure of the northbound on-ramp from Warner Avenue over the northbound off-ramp to Magnolia Street. Furthermore, due to the configuration of these ramps, absorptive materials/panels will be required on the traffic side of Soundwall S792 and on the retaining wall associated with Warner Avenue on-ramp to prevent the traffic noise from reflecting between the soundwall and retaining wall. Although Soundwall S788 would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of these residences to additional traffic noise predicted under Alternative 2 due to the elimination of the existing ramp structure; therefore, it is recommended. Soundwall S786 would be a new soundwall and together with Soundwalls S792 and S788 provides 5-dB of noise reduction for three single-family residences. The estimated total construction cost of Soundwall S786 is \$151,000 which exceeds the reasonable allowance of \$129,000; therefore, this soundwall is not recommended. Figure 10 in Appendix A2 of NSR shows locations and heights of these soundwalls.

With consideration of the acoustic benefit Soundwall S788 is recommended to be a 12-foot high masonry wall to connect to the in-kind replacement Soundwall S792 as shown on Figure 10 and Table 2 in Appendix A2 of this report.

Magnolia Street to Bolsa Avenue / Goldenwest Street

- **Soundwalls S807, S811, & S827:** Soundwall S827 is an in-kind replacement of an existing 10- to 12-foot high (2390 feet long) soundwall in this area that would be required regardless of cost. Soundwall S811 is also an in-kind replacement of an existing 10-foot high (480 feet long) soundwall which would be higher for a 300 feet long portion of the existing wall it would replace. Soundwall S807 would be located at the edge of shoulder and extend the coverage currently provided by existing soundwall, 575 feet southward. The minimum required wall heights for Soundwalls S807 and S811 to meet feasibility criterion are as shown on Figure 11 in Appendix A2 of NSR. However, constructing Soundwall S807 to a uniform 14-foot high wall would provide an additional 1-dB of noise reduction for the Pleasant View Park behind this wall. The estimated total construction cost of \$239,000 includes additional replacement cost of Soundwall S811 for the increased height and complete construction of Soundwall S807 at 14-foot high which is less than the maximum reasonable allowance of \$273,000; and therefore these walls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S811 is recommended to range from 10- to 16-foot high and Soundwall S807 to be uniform 14-foot high masonry walls as shown on Figure 11 and Table 2 in Appendix A2 of this report.

- **Soundwall S834:** Soundwall S834 located at the edge of shoulder along the northbound side of I-405 mainline would provide 5-dB of traffic noise reduction for six single-family residences. The estimated total construction cost of this soundwall is \$523,000 which exceeds the maximum reasonable allowance of \$270,000 and therefore this soundwall is not recommended. Figure 12 in Appendix A2 of NSR show the heights and length of Soundwall S834 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S834 is not reasonable and therefore is not recommended.

- **Soundwall S841:** Soundwall S841 would extend the coverage of an existing 12-foot high soundwall 525 feet to the north along the southbound shoulder of mainline to compensate for the encroachment of I-405 onto the existing overpass embankment at Newland Street. The minimum required wall heights for Soundwall S841 to meet feasibility criterion are as shown on Figure 12 in Appendix A2 of NSR. However, constructing a uniform 16-foot high wall would provide an additional 1-dB of noise reduction for residences behind this wall. The estimated total construction cost of \$205,000 for a uniform 16-foot high wall is less than the reasonable allowance of \$385,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S841 is reasonable and recommended to be a 16-foot high masonry wall as shown on Figure 12 and Table 2 in Appendix A2 of this report. In addition, there are two residences in this area that would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S841 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required for these residences. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for these residences.

- **Soundwall S857:** Soundwall S857 would be 225 feet long and located at the edge of shoulder along the southbound I-405 on-ramp at Edinger Avenue. The minimum required wall height for Soundwall S857 to meet feasibility criterion are as shown on Figure 12 in Appendix A2 of NSR. However, constructing Soundwall S857 to a uniform 14-foot height would provide an additional 1-dB of noise reduction for the residences behind this wall. The estimated total construction cost of \$82,000 for a uniform 14-foot high wall is less than the reasonable allowance of \$343,000; and therefore this soundwall is recommended for construction.

With consideration of the acoustic benefit and the incremental cost, Soundwall S857 is reasonable and recommended to be a 14-foot high masonry wall as shown on Figure 12 and Table 2 in Appendix A2 of this report.

- **Soundwall S868:** Soundwall S868 would be located at the right-of-way line of the northbound off-ramp to Beach Boulevard. The estimated total construction cost of this 16-foot high wall is \$121,000 which exceeds the reasonable allowance of \$35,000. Figure 13 in Appendix A2 of NSR shows the minimum height and length of Soundwall S868 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S868 is not reasonable and therefore is not recommended.

- **Soundwall S896:** Soundwall S896 is located on I-405 northbound mainline at the right-of-way and would extend an existing 14-foot high soundwall 110 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at McFadden Avenue. This soundwall reduces the exposure of nearby mobile homes to additional traffic noise predicted under Alternative 2 due to embankment modification; and therefore is recommended. Figure 14 in Appendix A2 of NSR shows the location and height of Soundwall S896.

With consideration of the acoustic benefit and the incremental cost, Soundwall S896 is recommended to be a 10-foot high masonry wall as shown on Figure 14 and Table 2 in Appendix A2 of this report.

- **Soundwalls S900, S908, & S916:** These soundwalls which act as a system would be located at the edge of shoulder along the northbound side of I-405. Soundwall S900 is an in-kind replacement of existing 8-foot high (710 feet long) wall and would be reconstructed regardless of cost. Soundwall S908 is also an in-kind replacement that would be higher than the existing 850 feet long soundwall. Soundwall S916 is a new wall and together with Soundwalls S900 and S908 would provide 5-dB of traffic noise protection for seven single family residences in this area. The minimum required wall heights for Soundwalls S908 and S916 to meet feasibility criterion are as shown on Figure 14 in Appendix A2 of NSR. The total construction cost of Soundwall S916 and the additional height requirement of Soundwall S908 are estimated to be \$361,000 which exceeds the reasonable allowance of \$315,000; and therefore these walls are not recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S908 is recommended to be an in-kind replacement of existing 8-foot high masonry wall as shown on Figure 14 and Table 2 in Appendix A2 of this report. Soundwall S916 is not reasonable and not recommended.

- **Soundwalls S907 & S141:** These soundwalls would be located at the edge of shoulder along the southbound side of I-405. Soundwall S141 is an in-kind replacement of existing 8-foot high (1,525 feet long) soundwall on the shoulder of the road and a portion of a 12-foot high soundwall on the R/W line. The replacement for the 12-foot high will be at the shoulder of the road and it will be 8-foot high because shoulder elevation is approximately 4 feet higher than the R/W line. Due to the elevation difference, top of the wall of the 8-foot high replacement soundwall would be same as the existing 12-foot high soundwall. Soundwall S141 would be reconstructed regardless of cost. Soundwall S907 is a new wall and provides 5-dB of traffic noise protection for the College Park in this area. The minimum required wall height for Soundwall S907 to meet feasibility criterion is shown on Figure 14 in Appendix A2 of NSR. However, constructing Soundwall S907 to a uniform 14-foot height would provide an additional 1-dB of noise reduction for the park behind this wall. The estimated total construction cost of Soundwall S907 at a height of 14-feet is \$232,000 which is less than the reasonable allowance of \$270,000. Therefore, this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S907 is recommended to be 14-foot high masonry wall as shown on Figure 14 and Table 2 in Appendix A2 of this report. Increased wall height would not provide any additional acoustic benefits.

- **Soundwall S935:** Soundwall S935 is 395 feet long and located at the right-of-way line along the southbound I-405 on-ramp from Bolsa Avenue. The minimum required wall heights for Soundwall S935 to meet feasibility criterion are as shown on Figure 15 in Appendix A2 of NSR, providing 5-dB of traffic noise protection for one of the residences behind this wall. However, constructing Soundwall S935 as a uniform 16-foot high wall would provide 5-dB of noise reduction for four of the residences in this area. The estimated total construction cost of this wall as proposed is \$147,000 which is less than the maximum reasonable allowance of \$180,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S935 is recommended to be a 16-foot high masonry wall as shown on Figure 15 and Table 2 in Appendix A2 of this report.

Bolsa Avenue / Goldenwest Street to SR-22 / Valley View Street, SR-22 East to Springdale Street

- **Soundwalls S182, S972, & S978:** These soundwalls which act as a system would be located at the edge of shoulder along the northbound side of I-405. Soundwall S182 is an in-kind replacement of existing 10-foot high (1,710 feet long) wall and would be reconstructed regardless of cost. Soundwall S972 is also an in-kind replacement that would be higher than the existing 410 feet

long soundwall. Soundwall S978 is a new 990 feet long wall, and together with Soundwalls S972 and S182 would provide 5-dB of traffic noise protection for the frontage units of Buckingham Park and Westminster High School as well as two single-family residences in this area. The minimum required wall heights for Soundwalls S972 and S978 to meet feasibility criterion are as shown on Figures 16 & 17 in Appendix A2 of NSR. However, constructing Soundwall S978 to a uniform 16-foot height would provide an additional 1-dB of noise reduction for the park and school behind this wall. The total construction cost of Soundwall S978 at 16-foot high and the additional height requirement of Soundwall S972 are estimated to be \$416,000 which is less than the reasonable allowance of \$507,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S972 is recommended to be between 12- to 16-foot high masonry walls and Soundwall S978 is recommended to be a uniform 16-foot masonry wall as shown on Figures 16 & 17 and Table 2 in Appendix A2 of this report.

- **Soundwall S995:** Soundwall S995 would be 200 feet long and located at the right-of-way line along the southbound side of I-405 replacing an existing soundwall at the same location with new height. The minimum heights and length of Soundwall S995 to provide feasible abatement are as shown on Figure 17 in Appendix A2 of NSR. The estimated total construction cost of this soundwall is \$81,000 which exceeds the reasonable allowance of \$74,000 and since there is an existing soundwall at this location, the construction of this wall is not recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S995 is not reasonable and therefore is not recommended.

- **Soundwall S998:** Soundwall S998 would be located at the right-of-way line along the northbound side of I-405 and would extend an existing soundwall 140 feet to the north. The minimum heights and length of Soundwall S998 to provide feasible abatement are as shown on Figure 17 in Appendix A2 of NSR. However, increasing the wall height to 16-foot would provide an additional 2-dB of noise protection for the residences behind this wall. The estimated total construction cost of this wall at \$53,000 is less than the reasonable allowance of \$94,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S998 is reasonable and therefore recommended to be 16-foot high masonry wall as shown on Figure 17 and Table 2 in Appendix A2 of this report.

Soundwall S1006: Soundwall S1006 would be 330 feet long and located at the right-of-way line along the northbound off-ramp to Westminster Boulevard. The minimum required wall height for Soundwall S1006 to meet feasibility criterion is 10-foot high as shown on Figure 17 in Appendix A2 of NSR. However, constructing a 16-foot high soundwall would provide an additional 3-dB of noise reduction for the exterior and interior areas of Motel 6 behind this wall. The estimated total construction cost of this 16-foot wall is \$123,000 which is less than the maximum reasonable allowance of \$385,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1006 is reasonable and recommended to be a 16-foot high masonry wall as shown on Figure 17 and Table 2 in Appendix A2 of this report. In addition, the outdoor pool area and the interior rooms of Motel 6 would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S1006 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required at this location. If building a soundwall is not reasonable due to other factors besides cost, then building other types of abatement must be considered for the pool area and interior rooms facing the freeway. However, owner of the motel may decline the construction of soundwall because it would block their visibility from the freeway.

- **Soundwalls S1005 & S1009:** Soundwall S1005 would replace and heighten an existing soundwall (175 feet long) at its current location and Soundwall S1009 would be 850 feet long and extends the coverage of Soundwall S1005 to the north along southbound on-ramp from Westminster Boulevard providing traffic noise reduction for the Cascade Park and residences in this area. The minimum required wall heights for these soundwalls to meet feasibility criterion are as shown on Figures 17 & 18 in Appendix A2 of NSR. However, constructing Soundwall S1009 to a height of 16-foot would provide an additional 1- to 2-dB of noise reduction for the park behind this wall. The total construction cost of Soundwall S1009 and the additional height requirement of Soundwall S1005 are estimated at \$320,000 which is less than the reasonable allowance of \$583,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, the Soundwall S1005 is recommended to be a 12-foot high masonry wall and Soundwall S1009 is recommended to be a 16-foot high masonry wall as shown on Figures 17 & 18 and Table 2 in Appendix A2 of this report. In addition, the park area and residences behind these walls would be severely impacted due to predicted peak hour noise level at or above 75 dBA without soundwalls in place. If the Soundwalls S1005 and S1009 are determined to be unreasonable based on cost during project design phase, providing the

soundwalls will still be required for these locations. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for potential noise impact in the interior of land use.

- **Soundwalls S1016, S1020, S1022, & S1024:** Soundwalls S1016 and S1020 would be located at the edge of shoulder along the northbound on-ramp from Westminster Boulevard and Soundwall S1022 and S1024 would be located within the right-of-way. Soundwalls S1020 (325 feet long) and S1022 (200 feet long) would be in-kind replacement soundwalls with a new height. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 18 in Appendix A2 of NSR. However, constructing Soundwall S1016 as a uniform 16-foot high soundwall would provide an additional 1-dB of noise reduction for the School Playground area. The total construction cost of Soundwalls S1016 and S1024 including the additional height requirement of Soundwalls S1020 and S1022 are estimated to be \$349,000 which is less than the reasonable allowance of \$376,000; and therefore all four soundwalls are recommended. Building Soundwall S1024 would also compensate for the encroachment of I-405 onto the existing overpass embankment at Springdale Street.

With consideration of the acoustic benefit and the incremental cost, Soundwalls S1016, S1020, S1022, and S1024 are recommended to be 16-foot high masonry walls as shown on Figure 18 and Table 2 in Appendix A2 of this report.

- **Soundwalls S1026 & S1028:** Soundwalls S1026 and S1028 would be located at the right-of-way line along the northbound I-405 mainline. Soundwall S1028 replaces and heightens a 200 feet portion of an existing soundwall at its current location and Soundwall S1026 extends the coverage of the Soundwall S1028 further south. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 18 in Appendix A2 of NSR. The total construction cost of Soundwalls S1026 and S1028 are estimated to be \$144,000 which exceeds the reasonable allowance of \$45,000. However, building Soundwall S1026 at 14-foot high reduces the exposure of four single-family residences to additional traffic noise predicted under Alternative 2 due to encroachment of I-405 on to the existing embankment at Springdale Street and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S1028 is not recommended and Soundwall S1026 is recommended to be a 14-foot high masonry wall as shown on Figure 18 and Table 2 in Appendix A2 of this report.

- **Soundwall S1083:** Soundwalls S1083 would be located at the right-of-way line along the southbound I-405 mainline along Valley View Street. The minimum required heights for this soundwall to meet feasibility criterion are

as shown on Figure 20 in Appendix A2 of NSR. However, constructing Soundwall S1083 as a 14- to 16-foot high wall would provide an additional 1-dB of noise reduction for the residences behind this wall. The total construction cost of Soundwall S1083 is estimated to be \$196,000 which is less than the maximum reasonable allowance of \$255,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S1083 is recommended to be a 14- to 16-foot high masonry wall as shown on Figure 20 and Table 2 in Appendix A2 of this report.

Valley View Street to Seal Beach Boulevard

- **Soundwall S1162:** Soundwall S1162 would be located at the edge of shoulder along the northbound side of I-405 and would extend an existing soundwall 700 feet to the north. The total construction cost of this wall is estimated to be from \$225,000 which exceeds the reasonable allowance of \$43,000. Figure 23 in Appendix A2 of NSR shows the height and length of Soundwall S1162 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1162 is not reasonable and therefore not recommended. However, this area is already partially protected by a 6-foot high private wall on top of a berm.

Seal Beach Boulevard to I-605

- **Soundwall S1226:** The purpose of Soundwall S1226 is to extend the coverage of an existing soundwall 440 feet north to compensate for the encroachment of I-405 onto the existing northbound I-405 to westbound SR-22 embankment that would occur under Alternative 2. The estimated total construction cost of this wall is \$163,000 which exceeds the maximum reasonable allowance of \$141,000. However this soundwall reduces the exposure of nine single-family residences to additional traffic noise predicted under Alternative 2 due to embankment modification; and therefore is recommended. Figure 25 in Appendix A2 of NSR shows the height and length of Soundwall S1226 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, Soundwall S1226 is recommended to be a 16-foot high masonry wall as shown on Figure 25 and Table 2 in Appendix A2 of this report.

Table 3-2 – Summary of Abatement Key Information Alt-2

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|--------------------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S708, S710 ² & S718 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 20 | \$900,000 | \$664,000 | Yes |
| | 16 | Yes | 24 | \$1,080,000 | \$721,000 | Yes |
| S733 | 8 | No | NA | NA | NA | NA |
| | 10 | Yes | 1 | \$43,000 | \$95,000 | No |
| | 12 | Yes | 1 | \$43,000 | \$107,000 | No |
| | 14 | Yes | 1 | \$45,000 | \$119,000 | No |
| | 16 | Yes | 1 | \$45,000 | \$129,000 | No |
| S745A | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 1 | \$37,000 | \$128,000 | No |
| | 14 | Yes | 2 | \$98,000 | \$144,000 | No |
| | 16 | Yes | 2 | \$98,000 | \$159,000 | No |
| S745B | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 1 | \$37,000 | \$96,000 | No |
| | 14 | Yes | 2 | \$98,000 | \$107,000 | No |
| | 16 | Yes | 2 | \$98,000 | \$119,000 | No |
| S746 | 8 | Yes | 1 | \$51,000 | \$45,000 | Yes |
| | 10 | Yes | 1 | \$51,000 | \$52,000 | No |
| | 12 | Yes | 1 | \$51,000 | \$59,000 | No |
| | 14 | Yes | 2 | \$102,000 | \$66,000 | Yes |
| | 16 | Yes | 2 | \$102,000 | \$73,000 | Yes |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-2 – Summary of Abatement Key Information Alt-2 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|--------------------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S765 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S766 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S786, S788 & S792 ² | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 3 | \$129,000 | \$163,000 | No |
| S807 & S811 ³ | 8 | Yes | 7 | \$259,000 | \$197,000 | Yes |
| | 10 | Yes | 7 | \$259,000 | \$218,000 | Yes |
| | 12 | Yes | 7 | \$273,000 | \$238,000 | Yes |
| | 14 | Yes | 7 | \$273,000 | \$259,000 | Yes |
| | 16 | Yes | 9 | \$351,000 | \$277,000 | Yes |
| S834 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 6 | \$270,000 | \$523,000 | No |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-2 – Summary of Abatement Key Information Alt-2 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|----------------|--------------------------|-----------------------------------|---|---|--|--|
| S841 | 8 | Yes | 2 | \$106,000 | \$132,000 | No |
| | 10 | Yes | 3 | \$165,000 | \$151,000 | Yes |
| | 12 | Yes | 4 | \$220,000 | \$169,000 | Yes |
| | 14 | Yes | 7 | \$385,000 | \$188,000 | Yes |
| | 16 | Yes | 7 | \$385,000 | \$205,000 | Yes |
| S857 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 7 | \$329,000 | \$74,000 | Yes |
| | 14 | Yes | 7 | \$343,000 | \$82,000 | Yes |
| | 16 | Yes | 7 | \$343,000 | \$89,000 | Yes |
| S868 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 1 | \$35,000 | \$121,000 | No |
| S896 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S907 | 8 | Yes | 1 | \$43,000 | \$163,000 | No |
| | 10 | Yes | 4 | \$172,000 | \$186,000 | No |
| | 12 | Yes | 6 | \$258,000 | \$209,000 | Yes |
| | 14 | Yes | 6 | \$270,000 | \$232,000 | Yes |
| | 16 | Yes | 6 | \$270,000 | \$253,000 | Yes |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-2 – Summary of Abatement Key Information Alt-2 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|-----------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S908 ⁴ & S916 | 8 | No | NA | NA | NA | NA |
| | 10 | Yes | 2 | \$86,000 | \$285,000 | No |
| | 12 | Yes | 5 | \$225,000 | \$311,000 | No |
| | 14 | Yes | 5 | \$225,000 | \$337,000 | No |
| | 16 | Yes | 7 | \$315,000 | \$361,000 | No |
| S935 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 4 | \$180,000 | \$147,000 | Yes |
| S972 ⁴ & S978 | 8 | Yes | 4 | \$140,000 | \$280,000 | No |
| | 10 | Yes | 6 | \$222,000 | \$315,000 | No |
| | 12 | Yes | 6 | \$222,000 | \$350,000 | No |
| | 14 | Yes | 6 | \$222,000 | \$385,000 | No |
| | 16 | Yes | 13 | \$507,000 | \$416,000 | Yes |
| S995 ³ | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 2 | \$74,000 | \$85,000 | No |
| S998 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 2 | \$90,000 | \$48,000 | Yes |
| | 16 | Yes | 2 | \$94,000 | \$53,000 | Yes |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-2 – Summary of Abatement Key Information Alt-2 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|---|------------------|---------------------------|--------------------------------------|----------------------------------|--|---------------------------------|
| S1005 ⁴ & S1009 | 8 | Yes | 2 | \$98,000 | \$196,000 | No |
| | 10 | Yes | 5 | \$255,000 | \$226,000 | Yes |
| | 12 | Yes | 11 | \$561,000 | \$258,000 | Yes |
| | 14 | Yes | 11 | \$561,000 | \$289,000 | Yes |
| | 16 | Yes | 11 | \$583,000 | \$320,000 | Yes |
| S1006 | 8 | Yes | 7 | \$357,000 | \$75,000 | Yes |
| | 10 | Yes | 7 | \$357,000 | \$86,000 | Yes |
| | 12 | Yes | 7 | \$371,000 | \$99,000 | Yes |
| | 14 | Yes | 7 | \$371,000 | \$111,000 | Yes |
| | 16 | Yes | 7 | \$385,000 | \$123,000 | Yes |
| S1016, S1020 ⁴ , S1022 ³ & S1024 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 8 | \$376,000 | \$349,000 | Yes |
| S1026 & S1028 ³ | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 1 | \$45,000 | \$144,000 | No |
| S1083 | 8 | No | NA | NA | NA | NA |
| | 10 | Yes | 2 | \$98,000 | \$144,000 | No |
| | 12 | Yes | 3 | \$153,000 | \$165,000 | No |
| | 14 | Yes | 5 | \$255,000 | \$185,000 | Yes |
| | 16 | Yes | 5 | \$255,000 | \$205,000 | Yes |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-2 – Summary of Abatement Key Information Alt-2 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|---------|------------------|---------------------------|--------------------------------------|----------------------------------|--|---------------------------------|
| S1162 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 1 | \$43,000 | \$225,000 | No |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S1226 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 3 | \$141,000 | \$163,000 | No |

- 1- Stations are approximate and correspond to I-405 mainline.
- 2- In-kind replacement of an existing soundwall at new location with same height.
- 3- Replacement of existing soundwall at same location with new height.
- 4- Replacement of existing soundwall at new location with new height.

Based on the information summarized in Table 3-3 and noise reductions specified in the NSR, the following discussion presents the engineer's recommendation on the proposed height and reasonableness of each soundwall for Build Alternative 3:

South of Bristol Street to Euclid Street

- **Soundwall S614A:** Soundwall S614A would be located at the shoulder of the northbound on-ramp from Harbor Boulevard. The estimated total construction cost of this 200 feet long wall is \$66,000 which exceeds the reasonable allowance of \$39,000. Figure 4 in Appendix A3 of NSR shows the minimum height and length of Soundwall S614A to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, construction of Soundwall S614A is not reasonable and therefore is not recommended.

- **Soundwall S614B (Option):** Soundwall S614B would be located on private property along the northbound side of I-405. This 64 feet long soundwall is an option to Soundwall S614A. The minimum required wall height for

Soundwall S614B to meet feasibility criterion is 8 feet as shown on Figure 4 in Appendix A3 of NSR. The estimated total construction cost of of an 8-foot high wall including temporary construction easement and temporary access is estimated at \$61,000 (\$45,000 in easement and \$16,000 in construction cost) which is more than the reasonable allowance of \$37,000 and therefore this soundwall is not recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S614B is not reasonable and therefore is not recommended.

Euclid Street to Magnolia Street

- **Soundwalls S708, S710, and S718:** These soundwalls which act as a system would be located along the northbound I-405 edge of shoulder and right-of-way line. Soundwall S710 is an in-kind replacement of existing 375 feet long soundwall and would be reconstructed regardless of cost. Soundwall S708 is 240 feet long and extends the coverage of Soundwall S710 to compensate for the widening of the embankment at Talbert Avenue. Soundwall S718 is 1,405 feet long and extends the Soundwall S710 protection north along the off-ramp to Brookhurst Avenue. The minimum required wall height for Soundwall S708 to meet feasibility criterion is 12 feet as shown on Figures 7 & 8 in Appendix A3 of NSR and increasing the height of this wall would not provide any additional acoustic benefits. However, constructing Soundwall S718 as a uniform 16-foot high wall would provide an additional 1- to 2-dB of noise reduction for residences behind this wall. The estimated total construction cost of Soundwalls S708 at 12-foot high and S718 at 16-foot high would be \$584,000 which is less than the reasonable allowance of \$945,000.

With consideration of the acoustic benefit and the incremental cost, Soundwall S708 is recommended to be a 12-foot high masonry wall and Soundwall S718 is recommended to be 16-foot high masonry wall as shown on Figures 7 & 8 and Table 3 in Appendix A3 of this report.

- **Soundwall S733:** Soundwall S733 would be located at the shoulder of the southbound off-ramp to Brookhurst Street. Figure 8 in Appendix A3 of NSR shows the minimum height and length of Soundwall S733 to provide feasible abatement. The estimated total construction cost of this wall is \$107,000 which exceeds the reasonable allowance of \$43,000.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S733 is not reasonable and therefore not recommended.

- **Soundwall S745:** Soundwall S745 would extend an existing property wall 750 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment. The southern portion of this wall (S745A)

replaces the 10-foot high (430 feet long) portion of an existing property wall with a 14- to 16-foot soundwall and the northern portion would be a new soundwall (S745B) providing traffic noise reduction for the Valley Vista high school. The minimum required wall heights for Soundwall S745 to meet feasibility criterion are as shown on Figure 9 in Appendix A3 of NSR. The estimated total construction cost of Soundwall S745A as proposed with combination of 14- to 16-foot sections would be \$150,000 which exceeds the reasonable allowance of \$98,000 for this segment of the wall and therefore is not recommended. In addition, the existing 10-foot high property wall provides some level of noise protection for these residences. The estimated total construction cost of Soundwall S745B as proposed at 16-foot high would be \$119,000 which exceeds the reasonable allowance of \$98,000. However, since the reconfigured embankment of Slater Avenue would expose nearby high school to increased traffic noise, the construction of this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S745A is not reasonable and therefore not recommended and Soundwall S745B is recommended to be a 16-foot high masonry wall as shown on Figure 9 and Table 3 in Appendix A3 of this report.

- **Soundwall S746:** Soundwall S746 would extend an existing soundwall 195 feet to the south to compensate for the encroachment of I-405 onto the existing overpass embankment and provides 5-dB of protection for a single-family residence as well as 7-dB of protection for a preschool playground. The estimated total construction cost of Soundwall S746 is \$59,000 which is less than the reasonable allowance of \$102,000. Increased wall height would not provide any additional benefited residences. Figure 9 in Appendix A3 of NSR shows the height and length of Soundwall S746 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, Soundwall S746 is recommended to be a 12-foot high masonry wall as shown on Figure 9 and Table 3 in Appendix A3 of this report. In addition, the playground area of the preschool in this area would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S746 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required for this location. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for potential noise impact in the interior of land use.

- **Soundwall S765:** Soundwall S765 would extend an existing 16-foot high soundwall 215 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at Bushard Street. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in

this area, it does reduce the exposure of four single-family residences to additional traffic noise predicted under Alternative 3 and therefore is recommended. Figure 9 in Appendix A3 of NSR shows the location and height of Soundwall S765.

With consideration of the acoustic benefit and the incremental cost, Soundwall S765 is recommended to range from 14- to 16-foot high masonry wall as shown on Figure 9 and Table 3 in Appendix A3 of this report.

- **Soundwall S766:** Soundwall S766 would extend an existing 14-foot high soundwall 145 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at Bushard Street. Although this soundwall would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of six single-family residences to additional traffic noise predicted under Alternative 3 and therefore is recommended. Figure 9 in Appendix A3 of NSR shows location and height of Soundwall S766.

With consideration of the acoustic benefit and the incremental cost, Soundwall S766 is recommended to be a 14-foot high masonry wall as shown on Figure 9 and Table 3 in Appendix A3 of this report.

- **Soundwalls S786, S788, & S792:** Soundwall S792 is an in-kind replacement of an existing 12-foot high (835 feet long) soundwall that would be required regardless of cost. Soundwall S788 is a new 12-foot high soundwall that extends Soundwall S792 to the south by 190 feet to compensate for the exposure of freeway traffic noise to five single-family residences due to the opening provided by the structure of the northbound on-ramp from Warner Avenue over the northbound off-ramp to Magnolia Street. Furthermore, due to the configuration of these ramps, absorptive materials/panels will be required on the traffic side of Soundwall S792 and on the retaining wall associated with Warner Avenue on-ramp to prevent the traffic noise from reflecting between the soundwall and retaining wall. Although Soundwall S788 would not provide 5-dB of traffic noise reduction for residences in this area, it does reduce the exposure of these residences to additional traffic noise predicted under Alternative 3 due to the elimination of the existing ramp structure; therefore, it is recommended. Soundwall S786 would be a new soundwall and together with Soundwalls S792 and S788 provides 5-dB of noise reduction for three single-family residences. The estimated total construction cost of Soundwall S786 is \$145,000 which exceeds the reasonable allowance of \$129,000; and therefore is not recommended. Figure 10 in Appendix A3 of NSR shows locations and heights of these soundwalls.

With consideration of the acoustic benefit, Soundwall S788 is recommended to be a 12-foot high masonry wall to connect to the in-kind replacement

Soundwall S792 as shown on Figure 10 and Table 3 in Appendix A3 of this report.

Magnolia Street to Bolsa Avenue / Goldenwest Street

- **Soundwalls S807, S811, & S827:** Soundwall S827 is an in-kind replacement of an existing 10- to 12-foot high (2,390 feet long) soundwall in this area that would be required regardless of cost. Soundwall 811 is also an in-kind replacement of an existing 10-foot high (480 feet long) soundwall which would be higher for a 300 feet long portion of the existing wall it would replace. Soundwall S807 would be located at the edge of shoulder and extend the coverage currently provided by existing soundwall 575 feet southward. The minimum required wall heights for Soundwalls S807 and S811 to meet feasibility criterion are as shown on Figure 11 in Appendix A3 of NSR. However, constructing Soundwall S807 to a uniform 14-foot high wall would provide an additional 1-dB of noise reduction for the Pleasant View Park behind this wall. The estimated total construction cost of \$239,000 includes additional replacement cost of Soundwall S811 for the increased height and complete construction of Soundwall S807 at 14-foot high which is less than the reasonable allowance of \$259,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S811 is recommended to range from 10- to 16-foot and Soundwall S807 to be uniform 14-foot high masonry walls as shown on Figure 11 and Table 3 in Appendix A3 of this report.

- **Soundwall S834:** The 1350 feet long Soundwall S834 located at the edge of shoulder along the northbound side of I-405 mainline would provide 5-dB of traffic noise reduction for seven single-family residences. The estimated total construction cost of this soundwall is \$523,000 which exceeds the maximum reasonable allowance of \$495,000. Figure 12 in Appendix A3 of NSR shows the heights and length of Soundwall S834 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S834 is not reasonable and therefore not recommended.

- **Soundwall S841:** Soundwall 841 would extend the coverage of an existing 12-foot high soundwall 525 feet to the north along the southbound shoulder of mainline to compensate for the encroachment of I-405 onto the existing overpass embankment at Newland Street. The minimum required wall heights for Soundwall S841 to meet feasibility criterion are as shown on Figure 12 in Appendix A3 of NSR. However, constructing a uniform 16-foot high wall would provide an additional 1- to 2-dB of noise reduction for residences behind this wall. The estimated total construction cost of \$205,000 for a

uniform 16-foot high wall is less than the reasonable allowance of \$385,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S841 is reasonable and recommended to be a uniform 16-foot high masonry wall as shown on Figure 12 and Table 3 in Appendix A3 of this report. In addition, there are two residences in this area that would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S841 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required for these residences. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for these residences.

- **Soundwall S857:** Soundwall S857 would be 225 feet long and located at the edge of shoulder along the southbound I-405 on-ramp at Edinger Avenue. The minimum required wall height for Soundwall S857 to meet feasibility criterion are as shown on Figures 12 & 13 in Appendix A3 of NSR. However, constructing Soundwall S857 to a uniform 14-foot height would provide an additional 1-dB of noise reduction for the residences behind this wall. The estimated total construction cost of \$82,000 for a uniform 14-foot high wall is less than the reasonable allowance of \$343,000; and therefore this soundwall is recommended for construction.

With consideration of the acoustic benefit and the incremental cost, Soundwall S857 is reasonable and recommended to be a 14-foot high masonry wall as shown on Figures 12 & 13 and Table 3 in Appendix A3 of this report.

- **Soundwall S868:** Soundwall S868 would be located at the right-of-way line of the northbound off-ramp to Beach Boulevard. The estimated total construction cost of this 16-foot high wall is \$121,000 which exceeds the reasonable allowance of \$35,000. Figure 13 in Appendix A3 of NSR shows the minimum height and length of Soundwall S868 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S868 is not reasonable and therefore not recommended.

- **Soundwall S896:** Soundwall S896 is located on I-405 northbound mainline at the right-of-way and would extend an existing 14-foot high soundwall 110 feet to the north to compensate for the encroachment of I-405 onto the existing overpass embankment at McFadden Avenue. This soundwall reduces the exposure of nearby mobile homes to additional traffic noise predicted under Alternative 3 due to embankment modification; and therefore is

recommended. Figure 14 in Appendix A3 of NSR shows the location and height of Soundwall S896.

With consideration of the acoustic benefit and the incremental cost, Soundwall S896 is recommended to be a 10-foot high masonry wall as shown on Figure 14 and Table 3 in Appendix A3 of this report.

- **Soundwalls S902, S910, & S916:** These soundwalls which act as a system would be located at the edge of shoulder along the northbound side of I-405. Soundwall S902 is an in-kind replacement of existing 8-foot high and 1110 feet long wall that would be reconstructed regardless of cost. Soundwall S910 is also an in-kind replacement that would be higher than the existing 450-foot long soundwall. The 750-foot long Soundwall S916 is a new wall and together with Soundwalls S902 and S910 would provide 5-dB of traffic noise protection for five single family residences in this area. The minimum required wall heights for Soundwalls S910 and S916 to meet feasibility criterion are as shown on Figures 14 & 15 in Appendix A3 of NSR. Increased wall heights for wall S910 would not provide any additional acoustic benefits. However, constructing wall S916 as a uniform 14-foot high wall would provide an additional 2-dB of noise reduction for two of the residences behind this wall. The total construction cost of Soundwall S916 and the additional height requirement of Soundwall S910 are estimated to be \$292,000 which is less than the reasonable allowance of \$315,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S910 is recommended to be between 10- to 12-foot high masonry wall and Soundwall S916 is recommended to be 14-foot high masonry wall as shown on Figures 14 & 15 and Table 3 in Appendix A3 of this report.

- **Soundwalls S907 & S141:** These soundwalls would be located at the edge of shoulder along the southbound side of I-405. Soundwall S141 is an in-kind replacement of existing 8-foot high and 1,525 feet long soundwall on the shoulder of the road and a portion of a 12-foot high soundwall on the R/W line. The replacement for the 12-foot high will be at the shoulder of the road and it will be 8-foot high because shoulder elevation is approximately 4 feet higher than the R/W line. Due to the elevation difference, top of the wall of the 8-foot high replacement soundwall would be same as the existing 12-foot high soundwall. Soundwall S141 that would be reconstructed regardless of cost. Soundwall S907 is a new wall and provides 5-dB of traffic noise protection for the College Park in this area. The minimum required wall height for Soundwall S907 to meet feasibility criterion is shown on Figure 14 in Appendix A3 of NSR and increased wall height would not provide any additional acoustic benefits. The estimated total construction cost of Soundwall S907 is \$232,000 which is less than the reasonable allowance of \$270,000. Therefore, this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S907 is recommended to be 10- to 12-foot high masonry wall as shown on Figure 14 and Table 3 in Appendix A3 of this report.

- **Soundwall S935:** Soundwall S935 is located at the right-of-way line along the southbound I-405 on-ramp from Bolsa Avenue. The minimum required wall heights for Soundwall S935 to meet feasibility criterion are as shown on Figure 15 in Appendix A3 of NSR, providing 5-dB of traffic noise protection for one of the residences behind this wall. However, constructing Soundwall S935 as a uniform 16-foot high wall would provide 5-dB of noise reduction for four of the residences in this area. The estimated total construction cost of this 16-foot high wall is \$147,000 which is less than the maximum reasonable allowance of \$180,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S935 is recommended to be a 16-foot high masonry wall as shown on Figure 15 and Table 3 in Appendix A3 of this report.

Bolsa Avenue / Goldenwest Street to SR-22 / Valley View Street, SR-22 East to Springdale Street

- **Soundwalls S182, S972, & S978:** These soundwalls which act as a system would be located at the edge of shoulder along the northbound side of I-405. Soundwall S182 is an in-kind replacement of existing 10-foot high (1,810 feet long) wall and would be reconstructed regardless of cost. Soundwall S972 is also an in-kind replacement that would be higher than the existing 310 feet long soundwall. The 990 feet long Soundwall S978 is a new wall and together with Soundwalls S972 and S182 would provide 5-dB of traffic noise protection for the Buckingham Park and Westminster High School in this area. The minimum required wall heights for Soundwalls S972 and S978 to meet feasibility criterion are as shown on Figures 16 & 17 in Appendix A3 of NSR. However, constructing Soundwall S978 to range from 14- to 16-foot height would provide an additional 1-dB of noise reduction for the park and school behind this wall. The total construction cost of Soundwall S978 and the additional height requirement of Soundwall S972 are estimated to be \$392,000 which is less than the reasonable allowance of \$407,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwalls S972 and S978 are recommended to range between 14- to 16-foot high masonry walls as shown on Figures 16 & 17 and Table 3 in Appendix A3 of this report.

- **Soundwall S995:** the 200 feet long Soundwall S995 would be located at the right-of-way line along the southbound side of I-405 and would replace an existing soundwall at the same location with new height. The minimum

heights and length of Soundwall S995 to provide feasible abatement are as shown on Figure 17 in Appendix A3. The estimated total construction cost of this soundwall is \$81,000 which exceeds the reasonable allowance of \$78,000 and since there is an existing soundwall at this location, the construction of this wall is not recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S995 is not reasonable and therefore is not recommended.

- **Soundwall S998:** Soundwall S998 would be located at the right-of-way line along the northbound side of I-405 and would extend an existing soundwall 140 feet to the north. Figure 17 in Appendix A3 of NSR shows the height and length of Soundwall S998 to provide feasible abatement. However, constructing this soundwall as a 16-foot high wall would provide an additional 2-dB of noise reduction for the residences behind this wall. The estimated total construction cost of this soundwall at \$53,000 is less than the reasonable allowance of \$94,000 for a height of 16 feet; and therefore is recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S998 is reasonable and recommended to be 16-foot high masonry wall as shown on Figure 17 and Table 3 in Appendix A3 of this report.

- **Soundwall S1006:** Soundwall S1006 would be 330 feet long and located at the right-of-way line along the northbound off-ramp to Westminster Boulevard. The minimum required wall height for Soundwall S1006 to meet feasibility criterion is 10-foot as shown on Figure 17 in Appendix A3 of NSR. However, constructing a 16-foot high soundwall would provide an additional 4-dB of noise reduction for the exterior and interior areas of Motel 6 behind this wall. The estimated total construction cost of this 16-foot wall is \$123,000 which is less than the reasonable allowance of \$385,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1006 is reasonable and recommended to be a 16-foot high masonry wall as shown on Figure 17 and Table 3 in Appendix A3 of this report. In addition, the outdoor pool area and the interior rooms of Motel 6 would be severely impacted due to predicted peak hour noise level at or above 75 dBA without a soundwall in place. If the Soundwall S1006 is determined to be unreasonable based on cost during project design phase, providing the soundwall will still be required at this location. If building a soundwall is not reasonable due to other factors besides cost, then building other types of abatement must be considered for the pool area and interior rooms facing the freeway. However, owner of the motel may decline the

construction of soundwall because it would block their visibility from the freeway.

- **Soundwalls S1005 & S1009:** Soundwall S1005 would replace and heighten an existing 175 feet long soundwall at its current location and the 850 feet long Soundwall S1009 would extend the coverage of Soundwall S1005 to the north along southbound on-ramp from Westminster Boulevard providing traffic noise reduction for the Cascade Park and residences in this area. The minimum required wall heights for these soundwalls to meet feasibility criterion are as shown on Figures 17 and 18 in Appendix A3 of NSR. However, constructing Soundwall S1009 to a height of 16-foot would provide an additional 1- to 2-dB of noise reduction for the park behind this wall. The total construction cost of Soundwall S1009 and the additional height requirement of Soundwall S1005 are estimated at \$320,000 which is less than the reasonable allowance of \$583,000; and therefore these soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, the Soundwall S1005 is recommended to be a 12-foot high masonry wall and Soundwall S1009 is recommended to be a 16-foot high masonry wall as shown on Figures 17 & 18 and Table 3 in Appendix A3 of this report. In addition, the park area and residences behind these walls would be severely impacted due to predicted peak hour noise level at or above 75 dBA without soundwalls in place. If the soundwalls S1005 and S1009 are determined to be unreasonable based on cost during project design phase, providing the soundwalls will still be required at these locations. If building a soundwall is not reasonable due to other factors besides cost, then other types of abatement must be considered for potential noise impact in the interior of the land use.

- **Soundwalls S1016, S1020, S1022, & S1024:** Soundwalls S1016 and S1020 would be located at the edge of shoulder along the northbound on-ramp from Westminster Boulevard and Soundwall S1022 and S1024 would be located within the right-of-way. Soundwalls S1020 (325 feet long) and S1022 (200 feet long) would be in-kind replacement soundwalls with a new height. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 18 in Appendix A3 of NSR. However, constructing Soundwall S1016 as a uniform 16-foot high wall would provide an additional 1-dB of noise reduction for the School Playground area. The total construction cost of Soundwalls S1016 and S1024 including the additional height requirement of Soundwalls S1020 and S1022 are estimated to be \$349,000 which is less than the reasonable allowance of \$392,000; and therefore all four soundwalls are recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwalls S1016, S1020, S1022, and S1024 are recommended to be 16-foot

high masonry walls as shown on Figure 18 and Table 3 in Appendix A3 of this report.

- **Soundwalls S1026 & S1028:** Soundwalls S1026 and S1028 would be located at the right-of-way line along the northbound I-405 mainline. Soundwall S1028 replaces and heightens a 75 feet portion of an existing soundwall at its current location and Soundwall S1026 extends the coverage of the Soundwall S1028 further south. The minimum required heights for these soundwall to meet feasibility criterion are as shown on Figure 18 in Appendix A3 of NSR. The total construction cost of Soundwalls S1026 and S1028 are estimated to be \$73,000 which exceeds the reasonable allowance of \$47,000. However, building Soundwall S1026 at 14-foot high reduces the exposure of four single-family residences to additional traffic noise predicted under Alternative 3 due to encroachment of I-405 on to the existing embankment at Springdale Street and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S1028 is not recommended and Soundwall S1026 is recommended to be a 14-foot high masonry wall as shown on Figure 18 and Table 3 in Appendix A3 of this report.

- **Soundwall S1083:** Soundwalls S1083 would be located at the right-of-way line along the southbound I-405 mainline along Valley View Street. The minimum required heights for this soundwall to meet feasibility criterion are as shown on Figure 20 in Appendix A3 of NSR. However, constructing Soundwall S1083 as a 14- to 16-foot high wall would provide an additional 1- to 2-dB of noise reduction for the residences behind this wall. The total construction cost of Soundwall S1083 is estimated to be \$194,000 which is less than the maximum reasonable allowance of \$255,000; and therefore this soundwall is recommended.

With consideration of the acoustic benefit and the incremental cost, Soundwall S1083 is recommended to be a 14- to 16-foot high masonry wall as shown on Figure 20 and Table 3 in Appendix A3 of this report.

Valley View Street to Seal Beach Boulevard

- **Soundwall S1162:** Soundwall S1162 would be located at the edge of shoulder along the northbound side of I-405 and would extend an existing soundwall 700 feet along the northbound side. The total construction cost of this wall is estimated to be \$225,000 which exceeds the reasonable allowance of \$90,000. Figure 23 in Appendix A3 of NSR shows the height and length of Soundwall S1162 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, the construction of Soundwall S1162 is not reasonable and therefore not

recommended. However, this area is already partially protected by a 6-foot high private wall on top of a berm.

Seal Beach Boulevard

- **Soundwall S1226:** The purpose of Soundwall S1226 is to extend the coverage of an existing soundwall 440 feet north to compensate for the encroachment of I-405 onto the existing northbound I-405 to westbound SR-22 embankment that would occur under Alternative 3. The estimated total construction cost of this wall is \$163,000 which exceeds the maximum reasonable allowance of \$141,000. However this soundwall reduces the exposure of nine single-family residences to additional traffic noise predicted under Alternative 3 due to embankment modification; and therefore is recommended. Figure 25 in Appendix A3 of NSR shows the height and length of Soundwall S1226 to provide feasible abatement.

With consideration of the acoustic benefit and the incremental cost, Soundwall S1226 is recommended to be a 16-foot high masonry wall as shown on Figure 25 and Table 3 in Appendix A3 of this report.

Table 3-3 – Summary of Abatement Key Information Alt-3

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|--------------------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S614A | 8 | Yes | 1 | \$37,000 | \$51,000 | No |
| | 10 | Yes | 1 | \$37,000 | \$59,000 | No |
| | 12 | Yes | 1 | \$39,000 | \$66,000 | No |
| | 14 | Yes | 1 | \$39,000 | \$73,000 | No |
| | 16 | Yes | 1 | \$41,000 | \$79,000 | No |
| S614B | 8 | Yes | 1 | \$37,000 | \$61,000 | No |
| | 10 | Yes | 1 | \$39,000 | \$63,000 | No |
| | 12 | Yes | 1 | \$41,000 | \$66,000 | No |
| | 14 | Yes | 1 | \$41,000 | \$68,000 | No |
| | 16 | Yes | 1 | \$41,000 | \$70,000 | No |
| S708, S710 ² & S718 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 19 | \$855,000 | \$539,000 | Yes |
| | 16 | Yes | 21 | \$945,000 | \$584,000 | Yes |
| S733 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 1 | \$43,000 | \$107,000 | No |
| | 14 | Yes | 1 | \$43,000 | \$119,000 | No |
| | 16 | Yes | 1 | \$45,000 | \$129,000 | No |
| S745A | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 1 | \$39,000 | \$144,000 | No |
| | 16 | Yes | 2 | \$98,000 | \$159,000 | No |

- 1- Stations are approximate and correspond to I-405 mainline.
- 2- In-kind replacement of an existing soundwall at new location with same height.
- 3- Replacement of existing soundwall at same location with new height.
- 4- Replacement of existing soundwall at new location with new height.

Table 3-3 – Summary of Abatement Key Information Alt-3 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|--------------------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S745B | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 1 | \$39,000 | \$107,000 | No |
| | 16 | Yes | 2 | \$98,000 | \$119,000 | No |
| S746 | 8 | Yes | 1 | \$51,000 | \$45,000 | Yes |
| | 10 | Yes | 2 | \$102,000 | \$52,000 | Yes |
| | 12 | Yes | 2 | \$102,000 | \$59,000 | Yes |
| | 14 | Yes | 2 | \$102,000 | \$66,000 | Yes |
| | 16 | Yes | 2 | \$102,000 | \$73,000 | Yes |
| S765 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S766 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S786, S788 & S792 ² | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 3 | \$129,000 | \$145,000 | No |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-3 – Summary of Abatement Key Information Alt-3 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|-----------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S807 & S811 ³ | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 7 | \$259,000 | \$238,000 | Yes |
| | 14 | Yes | 7 | \$259,000 | \$259,000 | Yes |
| | 16 | Yes | 9 | \$333,000 | \$287,000 | Yes |
| S834 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 11 | \$495,000 | \$523,000 | No |
| S841 | 8 | Yes | 2 | \$106,000 | \$132,000 | No |
| | 10 | Yes | 3 | \$159,000 | \$151,000 | Yes |
| | 12 | Yes | 4 | \$220,000 | \$169,000 | Yes |
| | 14 | Yes | 7 | \$385,000 | \$188,000 | Yes |
| | 16 | Yes | 7 | \$385,000 | \$205,000 | Yes |
| S857 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 7 | \$329,000 | \$74,000 | Yes |
| | 14 | Yes | 7 | \$343,000 | \$82,000 | Yes |
| | 16 | Yes | 7 | \$343,000 | \$89,000 | Yes |
| S868 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 1 | \$35,000 | \$121,000 | No |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-3 – Summary of Abatement Key Information Alt-3 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|-----------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S896 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | No | NA | NA | NA | NA |
| S907 | 8 | Yes | 1 | \$43,000 | \$189,000 | No |
| | 10 | Yes | 4 | \$172,000 | \$216,000 | No |
| | 12 | Yes | 6 | \$270,000 | \$243,000 | Yes |
| | 14 | Yes | 6 | \$270,000 | \$269,000 | No |
| | 16 | Yes | 6 | \$270,000 | \$293,000 | No |
| S910 ⁴ & S916 | 8 | No | NA | NA | NA | NA |
| | 10 | Yes | 2 | \$86,000 | \$239,000 | No |
| | 12 | Yes | 7 | \$301,000 | \$266,000 | Yes |
| | 14 | Yes | 7 | \$315,000 | \$292,000 | Yes |
| | 16 | Yes | 7 | \$315,000 | \$316,000 | No |
| S935 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 4 | \$180,000 | \$147,000 | Yes |
| S972 ⁴ & S978 | 8 | Yes | 2 | \$70,000 | \$276,000 | No |
| | 10 | Yes | 4 | \$140,000 | \$311,000 | No |
| | 12 | Yes | 6 | \$222,000 | \$346,000 | No |
| | 14 | Yes | 9 | \$333,000 | \$381,000 | No |
| | 16 | Yes | 11 | \$407,000 | \$413,000 | No |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-3 – Summary of Abatement Key Information Alt-3 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Constructio n Cost | Cost Less than Allowance? |
|---|--------------------------|-----------------------------------|---|---|---|--|
| S995 ³ | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 2 | \$78,000 | \$85,000 | No |
| S998 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 2 | \$90,000 | \$48,000 | Yes |
| | 16 | Yes | 2 | \$94,000 | \$53,000 | Yes |
| S1005 ⁴ & S1009 | 8 | Yes | 2 | \$98,000 | \$196,000 | No |
| | 10 | Yes | 11 | \$561,000 | \$226,000 | Yes |
| | 12 | Yes | 11 | \$561,000 | \$258,000 | Yes |
| | 14 | Yes | 11 | \$561,000 | \$289,000 | Yes |
| | 16 | Yes | 11 | \$583,000 | \$320,000 | Yes |
| S1006 | 8 | Yes | 7 | \$357,000 | \$75,000 | Yes |
| | 10 | Yes | 7 | \$357,000 | \$86,000 | Yes |
| | 12 | Yes | 7 | \$371,000 | \$99,000 | Yes |
| | 14 | Yes | 7 | \$371,000 | \$111,000 | Yes |
| | 16 | Yes | 7 | \$385,000 | \$123,000 | Yes |
| S1016, S1020 ⁴ , S1022 ³ & S1024 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | Yes | 5 | \$235,000 | \$331,000 | No |
| | 16 | Yes | 8 | \$392,000 | \$349,000 | Yes |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

Table 3-3 – Summary of Abatement Key Information Alt-3 (Cont.)

| Barrier | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Masonry Estimated Construction Cost | Cost Less than Allowance? |
|-------------------------------|--------------------------|-----------------------------------|---|---|--|--|
| S1026 & S1028 ³ | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 1 | \$47,000 | \$73,000 | No |
| S1083 | 8 | No | NA | NA | NA | NA |
| | 10 | Yes | 2 | \$98,000 | \$144,000 | No |
| | 12 | Yes | 2 | \$102,000 | \$165,000 | No |
| | 14 | Yes | 5 | \$255,000 | \$185,000 | Yes |
| | 16 | Yes | 5 | \$255,000 | \$205,000 | Yes |
| S1162 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | Yes | 2 | \$90,000 | \$225,000 | No |
| | 14 | Yes | 2 | \$90,000 | \$250,000 | No |
| | 16 | No | NA | NA | NA | NA |
| S1226 | 8 | No | NA | NA | NA | NA |
| | 10 | No | NA | NA | NA | NA |
| | 12 | No | NA | NA | NA | NA |
| | 14 | No | NA | NA | NA | NA |
| | 16 | Yes | 3 | \$141,000 | \$163,000 | No |

1- Stations are approximate and correspond to I-405 mainline.

2- In-kind replacement of an existing soundwall at new location with same height.

3- Replacement of existing soundwall at same location with new height.

4- Replacement of existing soundwall at new location with new height.

4. Secondary Effects of Abatement

There are no additional impacts or secondary effects on cultural resources, scenic views, hazardous materials, biology, or other resources expected to occur.

5. References

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Caltrans, 2007. Highway Design Manual – Chapter 1100 Highway Traffic Noise Abatement. (<http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>)

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Caltrans Cost Data, Bid Summary (<http://www.dot.ca.gov/hq/esc/oe/awards/>)

Caltrans, 2009a. Project Development Procedures Manual. (<http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm>)

Appendix A Engineer's Recommendation

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TABLE 1 – Noise Abatement Information (Alt-1)

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S649 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S699 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S705 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S710 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S708 | 12 | Yes | 21 | \$945,000 | \$584,000 | Yes | Reasonable |
| S718 | 16 | | | | | | Reasonable |
| S733 | 12-14 | Yes | 1 | \$43,000 | \$112,000 | No | Not Reasonable |
| S746 | 12 | Yes | 2 | \$98,000 | \$59,000 | Yes | Reasonable |
| S747A | 12-14 | Yes | 2 | \$98,000 | \$137,000 | No | Not Reasonable |
| S747B | 16 | Yes | 2 | \$98,000 | \$119,000 | No | Replace in-kind* |
| S765 | 14-16 | No | N/A | N/A | \$74,000 | N/A | Replace in-kind* |
| S766 | 14 | No | N/A | N/A | \$50,000 | N/A | Replace in-kind* |
| S788 | 12 | No | N/A | N/A | \$62,000 | N/A | Replace in-kind* |
| S792 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S807 | 16 | Yes | 9 | \$333,000 | \$258,000 | Yes | Reasonable |
| S811 | 16 | | | | | | Replace in-kind (higher) |
| S819 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S828A | 12-14-16 | Yes | 3 | \$129,000 | \$118,000 | Yes | Replace in-kind (higher) |
| S828B | 12-14-16 | Yes | 9 | \$405,000 | \$557,000 | No | Not Reasonable |
| S841 | 16 | Yes | 7 | \$399,000 | \$214,000 | Yes | Reasonable |
| S857 | 12 | Yes | 7 | \$329,000 | \$74,000 | Yes | Reasonable |
| S868 | 16 | Yes | 1 | \$35,000 | \$121,000 | No | Not Reasonable |
| S896 | 10 | No | N/A | N/A | \$30,000 | N/A | Replace in-kind* |
| S902 | 8 | No | N/A | N/A | N/A | N/A | Replace in-kind |

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TABLE 1 - Noise Abatement Information (Alt-1) Cont.

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S910 | 10-12-14 | Yes | 7 | \$315,000 | \$262,000 | Yes | Replace in-kind (higher) |
| S916 | 16 | | | | | | Reasonable |
| S909 | 14 | Yes | 6 | \$270,000 | \$169,000 | Yes | Reasonable |
| S911 | 10-12-14 | | | | | | Replace in-kind (higher) |
| S141 | 8-10 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S935 | 14 | Yes | 3 | \$135,000 | \$113,000 | Yes | Reasonable |
| S182 | 10 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S972 | 10 | Yes | 6 | \$222,000 | \$193,000 | Yes | Replace in-kind |
| S978 | 12 | | | | | | Reasonable |
| S995 | 12-16 | Yes | 2 | \$70,000 | \$76,000 | No | Not Reasonable |
| S998 | 16 | Yes | 2 | \$90,000 | \$53,000 | Yes | Reasonable |
| S1006 | 16 | Yes | 7 | \$371,000 | \$123,000 | Yes | Reasonable |
| S1009 | 16 | Yes | 11 | \$561,000 | \$316,000 | Yes | Reasonable |
| S1016 | 16 | Yes | 8 | \$376,000 | \$308,000 | Yes | Reasonable |
| S1020 | 16 | | | | | | Replace in-kind (higher) |
| S1024 | 16 | | | | | | Reasonable |
| S1026 | 14 | Yes | 1 | \$45,000 | \$91,000 | No | Replace in-kind* |
| S1028 | 16 | | | | | | Not Reasonable |
| S1079 | 14 | Yes | 5 | \$245,000 | \$190,000 | Yes | Replace in-kind (higher) |
| S1083 | 14 | | | | | | Reasonable |

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TABLE 1 - Noise Abatement Information (Alt-1) Cont.

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S1162 | 12 | Yes | 1 | \$43,000 | \$225,000 | No | Not Reasonable |
| S431 | 10-14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S434 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S445 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1226 | 16 | Yes | 4 | \$188,000 | \$163,000 | Yes | Reasonable |
| S464 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |

* Replacement or gap closure soundwall for existing berm or natural abatement.

TABLE 2 - Noise Abatement Information (Alt-2)

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S649 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S699 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S705 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S710 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S708 | 12 | Yes | 24 | \$1,080,000 | \$721,000 | Yes | Reasonable |
| S718 | 16 | | | | | | Reasonable |
| S733 | 12 | Yes | 1 | \$43,000 | \$107,000 | No | Not Reasonable |
| S746 | 14 | Yes | 2 | \$102,000 | \$66,000 | Yes | Reasonable |
| S745A | 12-14 | Yes | 2 | \$98,000 | \$137,000 | No | Not Reasonable |
| S745B | 14 | Yes | 2 | \$98,000 | \$107,000 | No | Replace in-kind* |
| S765 | 14-16 | No | N/A | N/A | \$74,000 | N/A | Replace in-kind* |
| S766 | 14 | No | N/A | N/A | \$50,000 | N/A | Replace in-kind* |
| S786 | 14-16 | Yes | 3 | \$129,000 | \$151,000 | No | Not Reasonable |
| S788 | 12 | No | N/A | N/A | \$62,000 | N/A | Replace in-kind* |
| S792 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S807 | 14 | Yes | 7 | \$273,000 | \$239,000 | Yes | Reasonable |
| S811 | 10-16 | | | | | | Replace in-kind (higher) |
| S827 | 10-12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S834 | 16 | Yes | 6 | \$270,000 | \$523,000 | No | Not Reasonable |
| S841 | 16 | Yes | 7 | \$385,000 | \$205,000 | Yes | Reasonable |
| S857 | 14 | Yes | 7 | \$343,000 | \$82,000 | Yes | Reasonable |
| S868 | 16 | Yes | 1 | \$35,000 | \$121,000 | No | Not Reasonable |
| S896 | 10 | No | N/A | N/A | \$30,000 | N/A | Replace in-kind* |
| S900 | 8 | No | N/A | N/A | N/A | N/A | Replace in-kind |

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TABLE 2 - Noise Abatement Information (Alt-2) Cont.

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S908 | 8 | Yes | 7 | \$315,000 | \$361,000 | No | Replace in-kind |
| S916 | 16 | | | | | | Not Reasonable |
| S907 | 14 | Yes | 6 | \$270,000 | \$232,000 | Yes | Reasonable |
| S141 | 8 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S935 | 16 | Yes | 4 | \$180,000 | \$147,000 | Yes | Reasonable |
| S182 | 10 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S972 | 12-14-16 | Yes | 13 | \$507,000 | \$416,000 | Yes | Replace in-kind (higher) |
| S978 | 16 | | | | | | Reasonable |
| S995 | 14-16 | Yes | 2 | \$74,000 | \$81,000 | No | Not Reasonable |
| S998 | 16 | Yes | 2 | \$94,000 | \$53,000 | Yes | Reasonable |
| S1006 | 16 | Yes | 7 | \$385,000 | \$123,000 | Yes | Reasonable |
| S1005 | 12 | Yes | 11 | \$583,000 | \$320,000 | Yes | Replace in-kind (higher) |
| S1009 | 16 | | | | | | Reasonable |
| S1016 | 16 | Yes | 8 | \$376,000 | \$349,000 | Yes | Reasonable |
| S1020 | 16 | | | | | | Replace in-kind (higher) |
| S1022 | 16 | | | | | | Replace in-kind (higher) |
| S1024 | 16 | | | | | | Reasonable |
| S1026 | 14 | | | | | | Replace in-kind* |
| S1028 | 16 | Yes | 1 | \$45,000 | \$144,000 | No | Not Reasonable |

TABLE 2 - Noise Abatement Information (Alt-2) Cont.

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S1083 | 14-16 | Yes | 5 | \$255,000 | \$196,000 | Yes | Reasonable |
| S1116 | 18 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1142 | 18 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1162 | 12 | Yes | 1 | \$43,000 | \$225,000 | No | Not Reasonable |
| S431 | 10-14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S434 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S445 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1226 | 16 | Yes | 3 | \$141,000 | \$163,000 | No | Replace in-kind* |
| S464 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1037A | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1037B | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1044A | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1044B | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |

* Replacement or gap closure soundwall for existing berm or natural abatement.

TABLE 3 - Noise Abatement Information (Alt-3)

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S502 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S583 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S614A | 12 | Yes | 1 | \$39,000 | \$66,000 | No | Not Reasonable |
| S614B | 8 | Yes | 1 | \$37,000 | \$61,000 | No | Not Reasonable |
| S629 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S639 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S649 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S699 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S705 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S710 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S708 | 12 | Yes | 21 | \$945,000 | \$584,000 | Yes | Reasonable |
| S718 | 16 | | | | | | Reasonable |
| S733 | 12 | Yes | 1 | \$43,000 | \$107,000 | No | Not Reasonable |
| S745A | 14-16 | Yes | 2 | \$98,000 | \$150,000 | No | Not Reasonable |
| S745B | 16 | Yes | 2 | \$98,000 | \$119,000 | No | Replace in-kind* |
| S746 | 12 | Yes | 2 | \$102,000 | \$59,000 | Yes | Reasonable |
| S765 | 14-16 | No | N/A | N/A | \$74,000 | N/A | Replace in-kind* |
| S766 | 14 | No | N/A | N/A | \$50,000 | N/A | Replace in-kind* |
| S786 | 14-16 | Yes | 3 | \$129,000 | \$145,000 | No | Not Reasonable |
| S788 | 12 | No | N/A | N/A | \$62,000 | N/A | Replace in-kind* |
| S792 | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S807 | 14 | Yes | 7 | \$259,000 | \$239,000 | Yes | Reasonable |
| S811 | 10-16 | | | | | | Replace in-kind (higher) |
| S827 | 10-12 | No | N/A | N/A | N/A | N/A | Replace in-kind |

TABLE 3 - Noise Abatement Information (Alt-3) Cont.

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S834 | 16 | Yes | 11 | \$495,000 | \$523,000 | No | Not Reasonable |
| S841 | 16 | Yes | 7 | \$385,000 | \$205,000 | Yes | Reasonable |
| S857 | 14 | Yes | 7 | \$343,000 | \$82,000 | Yes | Reasonable |
| S868 | 16 | Yes | 1 | \$35,000 | \$121,000 | No | Not Reasonable |
| S896 | 10 | No | N/A | N/A | \$30,000 | N/A | Replace in-kind* |
| S902 | 8 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S910 | 10-12 | Yes | 7 | \$315,000 | \$292,000 | Yes | Replace in-kind (higher) |
| S916 | 14 | | | | | | Reasonable |
| S907 | 10-12 | Yes | 6 | \$270,000 | \$232,000 | Yes | Reasonable |
| S141 | 8 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S935 | 16 | Yes | 4 | \$180,000 | \$147,000 | Yes | Reasonable |
| S182 | 10 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S972 | 14-16 | Yes | 11 | \$407,000 | \$392,000 | Yes | Replace in-kind (higher) |
| S978 | 14-16 | | | | | | Reasonable |
| S995 | 14-16 | Yes | 2 | \$78,000 | \$81,000 | No | Not Reasonable |
| S998 | 16 | Yes | 2 | \$94,000 | \$53,000 | Yes | Reasonable |
| S1006 | 16 | Yes | 7 | \$385,000 | \$123,000 | Yes | Reasonable |
| S1005 | 12 | Yes | 11 | \$583,000 | \$320,000 | Yes | Replace in-kind (higher) |
| S1009 | 16 | | | | | | Reasonable |

.....

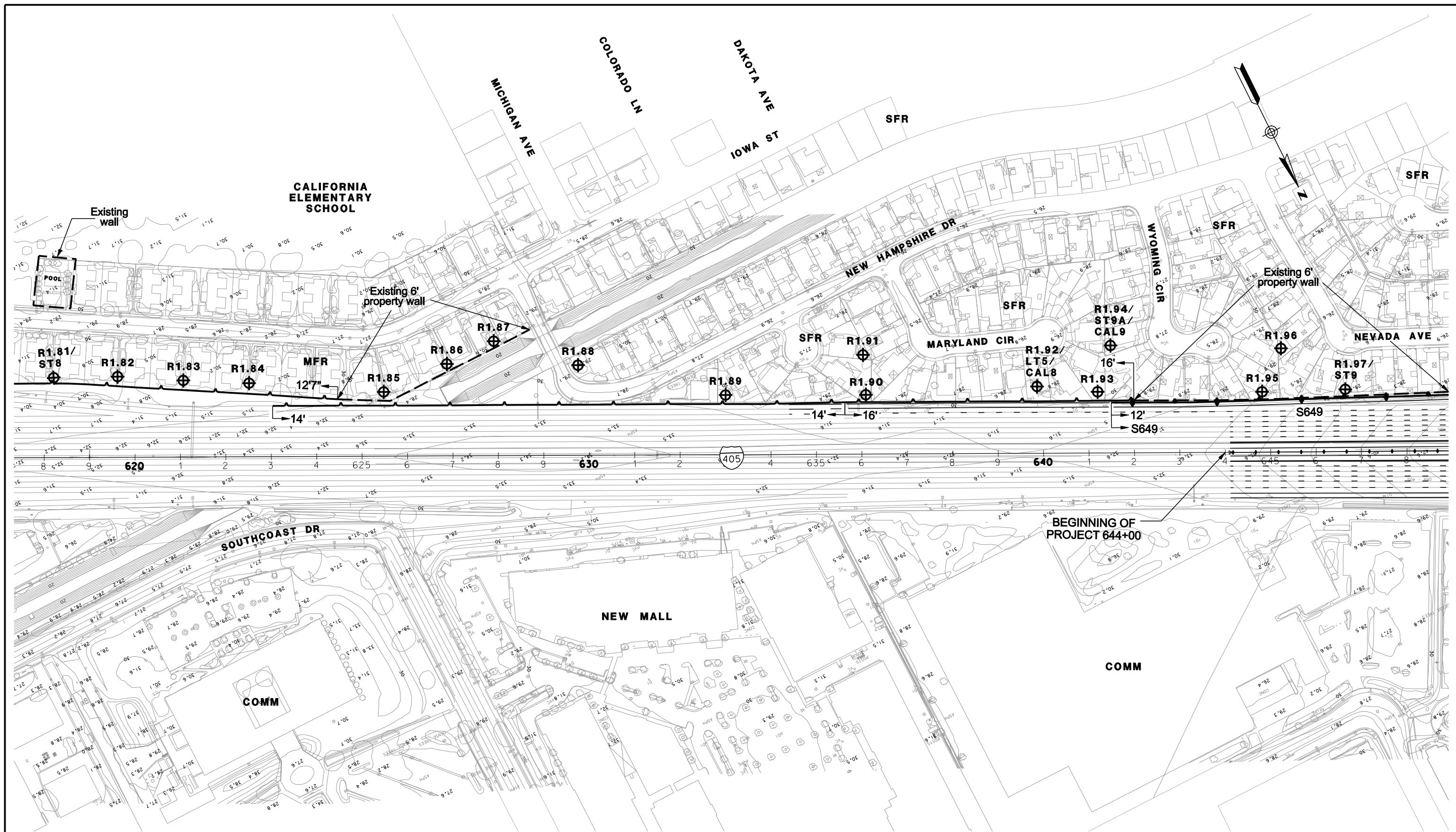
TABLE 3 - Noise Abatement Information (Alt-3) Cont.

| Noise Barrier No. | Height (feet) | Acoustically Feasible? | Number of Benefited Residences | Total Reasonable Allowance | Estimated Construction Cost | Cost Less than Allowance | Preliminary Noise Abatement Decision |
|-------------------|---------------|------------------------|--------------------------------|----------------------------|-----------------------------|--------------------------|--------------------------------------|
| S1016 | 16 | Yes | 8 | \$392,000 | \$349,000 | Yes | Reasonable |
| S1020 | 16 | | | | | | Replace in-kind (higher) |
| S1022 | 16 | | | | | | Replace in-kind (higher) |
| S1024 | 16 | | | | | | Reasonable |
| S1026 | 14 | Yes | 1 | \$47,000 | \$73,000 | No | Replace in-kind* |
| S1028 | 16 | | | | | | Not Reasonable |
| S1083 | 14-16 | Yes | 5 | \$255,000 | \$194,000 | Yes | Reasonable |
| S1116 | 18 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1132 | 18 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1162 | 12 | Yes | 2 | \$90,000 | \$225,000 | No | Not Reasonable |
| S431 | 10-14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S434 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S445 | 14 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1226 | 16 | Yes | 3 | \$141,000 | \$163,000 | No | Replace in-kind* |
| S464 | 16 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1037A | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1037B | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1044A | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |
| S1044B | 12 | No | N/A | N/A | N/A | N/A | Replace in-kind |

* Replacement or gap closure soundwall for existing berm or natural abatement.

APPENDIX A1

Recommended Barrier Heights & Locations for Alternative 1



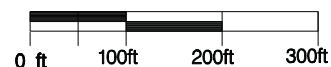
LEGEND

- ⊕ RXX - RECEIVER SITE
- ⊕ LT - LONGTERM MEASUREMENT
- ⊕ ST - SHORTTERM MEASUREMENT
- ⊕ CAL - CALIBRATION SITE

- EXISTING WALL
- SOUNDWALL
- EXISTING SOUNDWALL
- REPLACEMENT IN KIND SOUNDWALL

- SFR - SINGLE FAMILY RESIDENCE
- MFR - MULTI-FAMILY RESIDENCE
- COMM - COMMERCIAL
- b - BENEFITED RESIDENCE

1in : 200ft



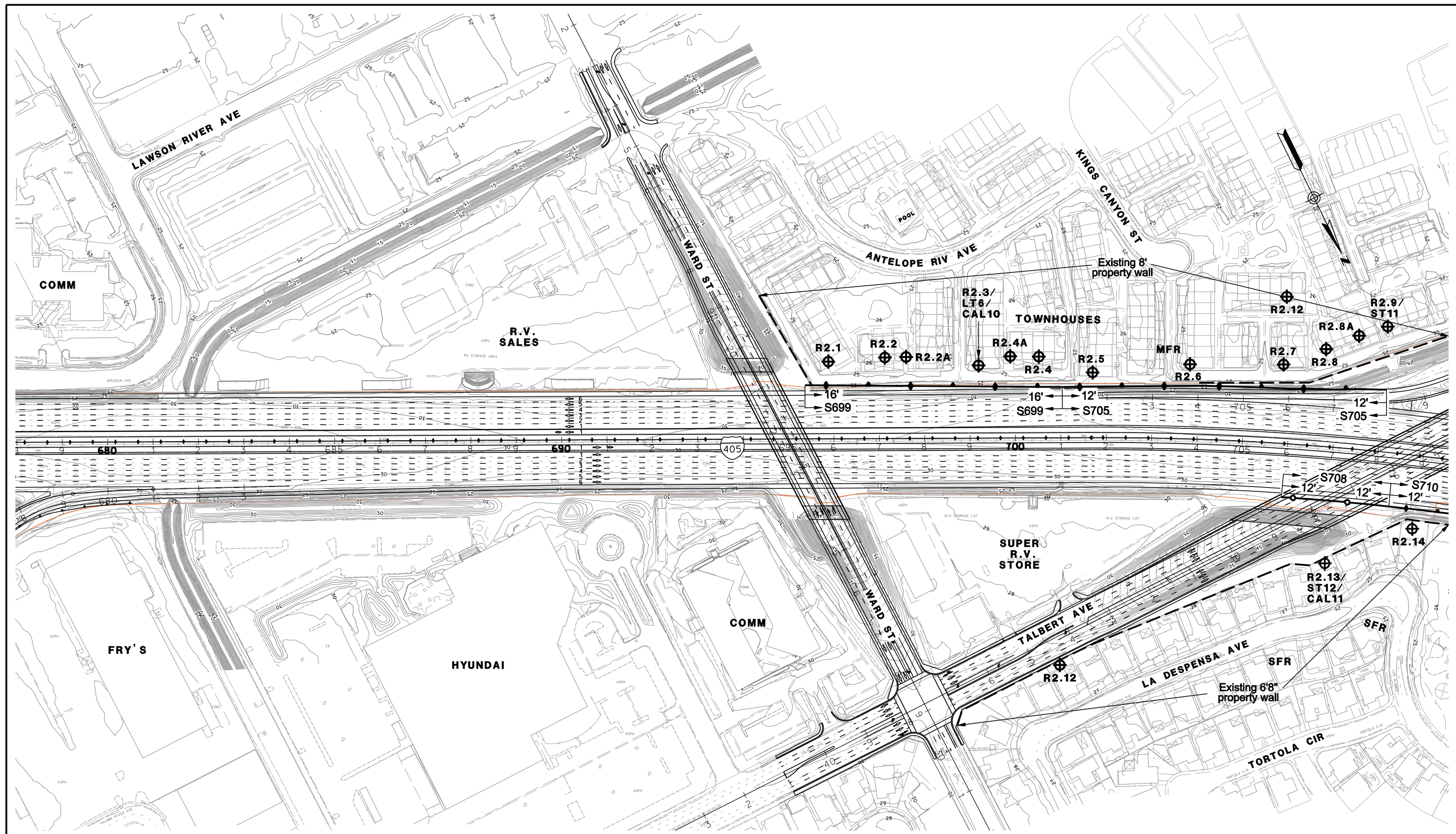
PARSONS

100 WEST WALNUT ST.
PASADENA, CA 91124
(626) 440-6100

I-405 WIDENING PA/ED PROJECT NADR RECOMMENDED BARRIER HEIGHTS & LOCATIONS ALT1

FEBRUARY 25, 2011

FIGURE 5



LEGEND

- ⊕RXX - RECEIVER SITE
- ⊕LT - LONGTERM MEASUREMENT
- ⊕ST - SHORTTERM MEASUREMENT
- ⊕CAL - CALIBRATION SITE

- EXISTING WALL
- SOUNDWALL
- ▲— EXISTING SOUNDWALL
- ◆— REPLACEMENT IN KIND SOUNDWALL

- SFR - SINGLE FAMILY RESIDENCE
- MFR - MULTI-FAMILY RESIDENCE
- COMM - COMMERCIAL
- b - BENEFITED RESIDENCE

1in : 200ft



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**I-405 WIDENING PA/ED PROJECT
NADR RECOMMENDED BARRIER
HEIGHTS & LOCATIONS ALT1**

FEBRUARY 25, 2011

FIGURE 7